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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant:	ALGIRDAS AVIZIENIS	Group Art Unit:
Appeal No.:	2009-003592	
Serial No.:	09/886,959	2113
Filed:	June 20, 2001	
Title:	"SELF-TESTING AND -REPAIRING FAULT-TOLERANT INFRASTRUC- TURE FOR COMPUTER SYSTEMS"	
Our docket:	xAAA-02	Examiner Bryce P. Bonzo

REQUEST FOR RECONSIDERATION  
BY THE BOARD OF APPEALS

Hon. Commissioner of Patents and Trademarks  
Postoffice Box 1450  
Alexandria VA 22313

Dear Sir:

Appellant notes that the Decision on Appeal issued November 2, 2009 contains two new grounds of rejection, in the paragraph bridging pages 26 and 27.

The undersigned apologizes for not knowing whether this paper should be sent directly to Examiner Bonzo, or directly

CERTIFICATION OF EXPRESS-MAIL DEPOSIT  
FOR THE PURPOSE OF SECURING ADVANCED FILING DATE

U. S. Express Mail mailing label: EG 134 463 637 US  
Date of deposit: January 4, 2010

I hereby certify that this document is being deposited with the United States Postal Service under 37 CFR 1.10 on the date indicated above, and is addressed to the Commissioner for Patents, Box 1450, Alexandria VA 22313.

Signed,

  
Peter I. Appman

to the Board. For the convenience of the Examiner and the Board, the substance of this document is being sent to both.

The Appellant sincerely wishes to thank the Board, and particularly Judge St. John Courtenay III, for having brought an increased degree of orderliness and reason to this case. Appellant finds that the Decision of the Board is very helpful in comprehending the issues presented.

#### NEW GROUND OF REJECTION

The Decision at pages 26 and 27, however, asserts (emphasis added):

"We find the Examiner's proffered combination of Best and Avizienis is merely a combination of familiar elements (i.e., a network of components having terminals, circuits for operating programs to guard the system from failure, and circuits for reacting to an error message (cf. claim 33)) according to known methods that yields a predictable result."

With respect, this passage both is factually inaccurate and is a new ground of rejection — because it goes well beyond the Examiner's assertions. First as to inaccuracy:

- The Best patent uses a table-lookup, which is not a program, to compare data from Best's different communications channels (the tables appear in column 7, full column) — and are discussed in column 6, lines 15 through 27). Thus Best's hardware circuits do not operate any program to guard his system from failure.
- The Avizienis paper describes an academic software experiment, called "DEDIX" — which had no "network",

no "component" and very plainly no terminal: it was entirely software (see, e. g., Examiner's Answer at page 16, lines 1 through 8).

Again, Avizienis's DEDIX programs (software) did not have any "network of components having terminals" and also did not have "circuits" for any purpose whatsoever. DEDIX was a software system composed of instructions that were assembled into programs (not circuits), and programs cannot have "terminals". "Circuits" and "terminals" are physical entities (hardware) while instructions and programs are abstract entities.

Thus the Appellant humbly submits that the Board Decision is factually inaccurate. Appellant most respectfully asks the Board to confirm that it is a factual error to assume, or to hold, that a table-lookup is a "program" or that software has circuits and terminals. These faulty assumptions pervade and color all § 103 rejections in this case.

Here the Appellant is not "attacking references individually" but rather is questioning the propriety of the combination. To reiterate, more specifically, the Decision finds "a combination of":

- "a network" and "terminals"; together with
- "circuits for operating programs";

— but DEDIX had none of these hardware pieces, and neither reference has "circuits for operating programs",

#### ANOTHER NEW GROUND OF REJECTION

Further, in the Board Decision, at the top of page 27, it is also asserted (emphasis added):

"[B]oth the Best and Avizienis references are directed to the same field of endeavor as the instant invention on appeal, i.e., fault-tolerant computer systems, and are thus analogous art."

This assertion, not made by the Examiner, is a new ground of rejection.

This "same field of endeavor" assertion might possibly be true in purest principle, i. e. in some idealized sense of the phrase "directed to". Only in the lofty sense of being "aimed" at some common but extremely remote goal, can the Best patent and the Avizienis paper be at all reasonably characterized as "directed to" a single common field — such as "fault-tolerant computer systems".

Patents, however, in their ideal form are not about pure or lofty principle — they are about practicalities, about pragmatic solutions to real-world practical problems. The present invention is a practical, buildable, badly needed device for deterring actual failure of entire, actual computing systems.

Without a patent it may never be built. The patent system, as our Constitution tells us, exists "to promote the progress of the useful arts." It does so by offering — to inventors and investors, and manufacturers too — incentive: a temporary monopoly, to invent and invest, and build.

In contrast to the present invention, both the Best patent and the Avizienis '85 paper are only fragmentary gestures in the direction of entire computing systems that are fault tolerant. Neither of these references is itself even fully in that field:

- THE PATENT TO BEST teaches not a fault-tolerant computer system — only a fault-tolerant communications SUBsys-

tem. Nothing in Best actually protects his whole computer system.

Guarding one subsystem against faults is not protecting an entire system — against e. g. failure of its processor(s), or against an avalanche of gamma rays slicing through a host vehicle, or against corrupt operating-system software. (The present invention does perform these critical functions, and many more.)

Thus, the assertion in Best's Abstract that he invented a "fault tolerant, fail-active computer system" is untrue — notwithstanding, with greatest respect, the corresponding Finding of Fact in the Board's Decision. The truth is that Best's invention, built of digital hardware, is at most capable of use as only part of a complete fault-tolerant computer system.

The art of designing computer hardware is commonly known as "digital design" or "computer hardware engineering" and is the art practiced by computer hardware engineers. These designations of field in this art will be compared, below, with analogous designations for the DEDIX experiment.

- THE AVIZIENIS PAPER describes not a fault-tolerant computer system — only an ordinary distributed software system ("a distributed supervisor and testbed. . . ." Avizienis, at 1496). Unlike various mischaracterizations of record, "DEDIX" was merely a tool for conducting N-version programming experiments.

The DEDIX programs (software) was programmed by computer programmers, whose art is nowadays commonly known as "software engineering".

These two art forms, "digital design" (or "computer hardware engineering") and "software engineering", are completely

distinct and different. Very few people have even "ordinary" skill (e. g. technician-level skill) in both.

To prove the distinctiveness, it is only necessary to browse defining literature and educational/workforce planning for the two fields:

- For engineering in general, please note the *Occupational Outlook Handbook, 2010-11 Edition* published by the Bureau of Labor Statistics of the U. S. Dept. of Labor ([www.bls.gov/oco/](http://www.bls.gov/oco/)). In listing professions, the major section *Engineers* ([www.bls.gov/oco/ocos027.htm](http://www.bls.gov/oco/ocos027.htm)) shows seventeen official classes of engineering profession.

Included are "computer hardware engineers". Most remarkably, however, the class "computer software engineers" is not even one of those seventeen!

Instead, there exists a separate major section, "Computer Software Engineers and Computer Programmers" ([www.bls.gov/oco/ocos303.htm](http://www.bls.gov/oco/ocos303.htm)). That separate section explains the nature of work in that profession.

- Alternatively, for computing perspective the Appellant respectfully calls attention to the publication *Software Engineering 2004* (<http://sites.computer.org/ccse/>) by the IEEE Computer Society and the Association for Computing Machinery.

The introductory "Overview" section of that publication lists four undergraduate curricula: " . . . one for each major area of computing: a Computer Science Volume, a Computer Engineering Volume, a Software Engineering Volume, and an Information Systems Volume."

The important points here are that separate undergraduate curricula exist for software engineering and computer (hardware) engineering — so that it would take two degrees to achieve the most basic recognized professional-level

skill in both professions. These facts relate to "the" field of fault-tolerant computing systems, and arise from the extreme difficulty and complexity of both software engineering and computer hardware engineering. These difficulties and complexities make the field of fault-tolerant computing systems nearly unique.

Hence, once again with great respect, the statement, in the Decision, that:

"the Best and Avizienis references are directed to the same field of endeavor as the instant invention on appeal, i.e., fault-tolerant computer systems, and are thus analogous art"

may be meaningful in purest principle — but as a practical matter is not. Best combined with Avizienis does not really teach artisans of ordinary skill how to build fault-tolerant computer systems.

If it did, then it would be reasonable to expect by now (nineteen years after Best and a quarter-century after the Avizienis experiment) to see such devices in the marketplace — or, without patents, at the very least in military apparatus. As we can see easily, the proposed Best+Avizienis combination does not suffice — not for avionics, not for spacecraft, and certainly not for our desktop or laptop computing systems.

Continuing into the next paragraph in the Decision, it is further said that the combination of references is proper (emphasis added):

"[W]e are not persuaded that combining the respective familiar elements of the cited references in the manner proffered by the Examiner was 'uniquely challenging or difficult for one of ordinary skill in the art [citation]'".

The daunting issue of what "the art" means has been explored above. The mind-bending question of what constitutes "ordinary skill" in "the" art is probably beyond our resources, but the Appellant respectfully offers the following thoughts.

Best's patent is in the hardware field. As can be noted, his patent says little or nothing about software details. Being a hardware man, Best doubtless knew little about software.

What makes the excerpts in the Decision a "new ground of rejection" is that the Examiner's stance is far more restrained than that in the Decision. Examiner Bonzo wrote in his Answer (paragraphs bridging pages 15 and 16, emphasis added) :

"2. Best does not disclose, while Avizienis teaches:

"at least one of the network terminals is connected to receive one error signal generated by such system in event of incipient such failure of such a system (page 1498 describes how the Decision and Executive layer receives exceptions from the version layer indicating errors within the instance running that particular version of the software) ;"

The Examiner's description never ventures as far as the Decision does. At first, the Decision says only that "one of the" network terminals is connected to receive an error signal — but, what network?

What terminals? Then the Examiner's description stops talking about Best combined with Avizienis, and in parentheses confides what Avizienis (alone) describes.

The Appellant respectfully notes that in the Decision of the Board, these guarded steps are hurdled, and the Deci-



The Appellant respectfully notes that in the Decision of the Board, these guarded steps are hurdled, and the Decision leaps forward to conclude, as pointed out earlier (emphasis added):

"[T]he Examiner's proffered combination of Best and Avizienis is merely a combination of familiar (elements (i.e., a network of components having terminals, circuits for operating programs to guard the system from failure, and circuits for reacting to an error message (cf. claim 33)) . . . ."

Now again back to Examiner Bonzo's text: in the next paragraph the Examiner's Answer repeats this rather elusive pattern (emphasis added):

"at least one of the network terminals is connected to provide one recovery signal to such system upon receipt of the error signal (page 1498 describe [sic] the use of the local executive processing faults and providing and [sic] solution to the problem; . . . ."

Here too, the Examiner's text at first says only that "one of the network terminals is connected" to provide a recovery signal.

What network?

There is no network — and these lacunae cannot be cured by suggesting that the Appellant is arguing the references separately. Rather, Appellant challenges the reality of the combination — the Examiner's account of the "proffered" combination.

What terminal? There is no terminal, either.

Neither the grounds of rejection stated by the Examiner nor those stated by the Board Decision squarely confront these allusions to components that are actually involved — either in the present invention or in the references.

Also in the Decision there appears a citation to *KSR Int'l Co. v. Teleflex Inc.* This case is often cited for "the need for caution in granting a patent based on the combination of elements found in the prior art".

The Supreme Court's overriding advice, however, is not simply to go forth and refuse patents, but rather to exercise "caution" — and, above all, the Court says, to use "common sense". Based upon the several concrete examples, above, of strictly well-known terms of art in the computer world being drastically misunderstood or misused, the Appellant most respectfully submits that a review of the basic features of the present invention, and of the cited references, might be helpful.

For this purpose, Appellant suggests the Appellant's response mailed May 12, 2006 — particularly at pages 48 (starting with the two bulleted paragraphs at bottom) through 54.

#### SECONDARY ISSUE

In the Board's Decision, it is said (page 21, emphasis added; please see also pages 12 & 13):

"'such computer system' could refer to a different computer system than the protected computer system, perhaps a similar computer system".

In response, the Appellant respectfully asks how this kind of interpretation could possibly arise in view of the explicit definition of "such" in the specification as originally filed — particularly at:

page 7, lines 8 through 16,

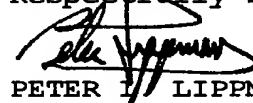
plus explicit statements about the nature of the inventions of claims 1 and 4, respectively — particularly in the specification at:

page 11, lines 5 through 12.

#### FILING OF A CONTINUATION

Appellant Avizienis notes the requirement that the Appellant inform the Board if a Continuation application is to be filed. The Appellant has, concurrently with this Request for Reconsideration, filed a Continuation.

Respectfully submitted,



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January 4, 2010

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